



1

SEQUENCE LISTING

<1> Frank Bennett  
Kenneth Dobie

<120> ANTISENSE MODULATION OF SUPEROXIDE DISMUTASE 1, SOLUBLE EXPRESSION

<130> ISPH-0756

<140> US 10/633,843

<141> 2003-08-04

<150> US 09/888,360

<151> 2001-06-21

<160> 90

<210> 1

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 1

tccgtcatcg ctcttcaggg

20

<210> 2

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 2

atgcattctg cccccaagga

20

<210> 3

<211> 874

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (65)...(529)

<400> 3

ctgcagcgtc tgggggtttcc gttgcagtcc tcggaaccag gacctcggcg tggcctagcg

60

agtt atg gcg acg aag gcc gtg tgc gtg ctg aag ggc gac ggc cca gtg

109

Met Ala Thr Lys Ala Val Cys Val Leu Lys Gly Asp Gly Pro Val

1

5

10

15

cag ggc atc atc aat ttc gag cag aag gaa agt aat gga cca gtg aag

157

Gln Gly Ile Ile Asn Phe Glu Gln Lys Glu Ser Asn Gly Pro Val Lys

20

25

30

|  |     |
|--|-----|
| gtg tgg gga agc att aaa gga ctg act gaa ggc ctg cat gga ttc cat    | 205 |
| Val Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly Leu His Gly Phe His    |     |
| 35 40 45   |     |
| ggt cat gag ttt gga gat aat aca gca ggc tgt acc agt gca ggt cct    | 253 |
| Val His Glu Phe Gly Asp Asn Thr Ala Gly Cys Thr Ser Ala Gly Pro    |     |
| 50 55 60   |     |
| cac ttt aat cct cta tcc aga aaa cac ggt ggg cca aag gat gaa gag    | 301 |
| His Phe Asn Pro Leu Ser Arg Lys His Gly Gly Pro Lys Asp Glu Glu    |     |
| 65 70 75   |     |
| agg cat gtt gga gac ttg ggc aat gtg act gct gac aaa gat ggt gtg    | 349 |
| Arg His Val Gly Asp Leu Gly Asn Val Thr Ala Asp Lys Asp Gly Val    |     |
| 80 85 90 95  |     |
| gcc gat gtg tct att gaa gat tct gtg atc tca ctc tca gga gac cat    | 397 |
| Ala Asp Val Ser Ile Glu Asp Ser Val Ile Ser Leu Ser Gly Asp His    |     |
| 100 105 110  |     |
| tgc atc att ggc cgc aca ctg gtg gtc cat gaa aaa gca gat gac ttg    | 445 |
| Cys Ile Ile Gly Arg Thr Leu Val His Glu Lys Ala Asp Asp Leu        |     |
| 115 120 125  |     |
| ggc aaa ggt gga aat gaa gaa agt aca aag aca gga aac gct gga agt    | 493 |
| Gly Lys Gly Gly Asn Glu Glu Ser Thr Lys Thr Gly Asn Ala Gly Ser    |     |
| 130 135 140  |     |
| cgt ttg gct tgt ggt gta att ggg atc gcc caa taa acattccctt         | 539 |
| Arg Leu Ala Cys Gly Val Ile Gly Ile Ala Gln                        |     |
| 145 150 155  |     |
| ggatgtagtc tgaggcccct taactcatct gttatcctgc tagctgtaga aatgtatcct  | 599 |
| gataaacatt aaacactgta atcttaaaag tgtaattgtg tgactttttc agagttgctt  | 659 |
| taaagtacct gtagtgagaa actgatttat gatcacttgg aagatttgta tagttttata  | 719 |
| aaactcagtt aaaatgtctg tttcaatgac ctgtattttg ccagacttaa atcacagatg  | 779 |
| ggtatataaac ttgtcagaat ttctttgtca ttcaagcctg tgaataaaaa ccctgtatgg | 839 |
| cacttattat gaggtatta aaagaatcca aattc                              | 874 |

<210> 4  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR Primer

|                        |    |
|------------------------|----|
| <400> 4                |    |
| cgtaggcctag cgagttatgg | 20 |

<210> 5  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
<223> PCR Primer

<400> 5  
gaaattgatg atgccctgca

20

<210> 6  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR Probe

<400> 6  
acgaaggccg tgtgcgtgct g

21

<210> 7  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR Primer

<400> 7  
gaaggtgaag gtcggagtc

19

<210> 8  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR Primer

<400> 8  
gaagatggtg atgggatttc

20

<210> 9  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR Probe

<400> 9  
caagcttccc gttctcagcc

20

<210> 10  
<211> 11000  
<212> DNA  
<213> Homo sapiens

&lt;400&gt; 10

|             |            |             |            |             |             |      |
|-------------|------------|-------------|------------|-------------|-------------|------|
| aaaaacgcag  | gtgatgccta | gaagccaact  | agttgccgtt | tggttatctg  | tagggttgtg  | 60   |
| gccttgccaa  | acaggaaaaa | tataaaaaaga | ataccgaatt | ctgccaaacca | aataagaaac  | 120  |
| tctatactaa  | ggactaagaa | aattgcaggg  | gaagaaaagg | taagtcccg   | gattgaggtg  | 180  |
| tagcgacttt  | ctataccctc | agaaaactaa  | aaaacaagac | aaaaaaatga  | aaactacaaa  | 240  |
| agcatccatc  | ttggggcgtc | ccaattgctg  | agtaacaaat | gagacgctgt  | ggccaaactc  | 300  |
| agtcataact  | aatgacattt | ctagacaaag  | tgacttcaga | ttttcaaagc  | gtaccctgtt  | 360  |
| tacatcattt  | tgccaatttc | gcgtactgca  | accggcgggc | cacgcccccg  | tgaaaagaag  | 420  |
| gttgttttct  | ccacatttcg | gggttctgga  | cgtttcccg  | ctgcggggcg  | gggggagtct  | 480  |
| ccggcgcacg  | cggccccttg | gccccgcccc  | cagtcattcc | cggccactcg  | cgacccgagg  | 540  |
| ctgccgcagg  | gggcgggctg | agcgcgtgcg  | aggcgattgg | tttggggcca  | gagtgggcca  | 600  |
| ggcgcgagg   | tctggcctat | aaagtagtcg  | cggagacggg | gtgctggttt  | gcgtcgtagt  | 660  |
| ctcctgcagc  | gtctgggggt | tccgttgagc  | tcttcggaac | caggacctcg  | gcgtggccta  | 720  |
| gcgagttatg  | gcgacgaagg | ccgtgtgctg  | gctgaagggc | gacggcccag  | tgaggggcat  | 780  |
| catcaatttc  | gagcagaagg | caagggtg    | gacggaggct | tgtttgag    | gccgctccca  | 840  |
| cccgtcgctc  | ccccgcgca  | cctttgctag  | gagcgggtcg | cccgccaggc  | ctcggggccg  | 900  |
| ccctgggtcca | gcgcccggtc | ccggcccgtg  | ccgcccggtc | ggtgccttcg  | cccccagcgg  | 960  |
| tgcggtgccc  | aagtgtgag  | tcaccggg    | ggcccggg   | cggggcggtg  | gaccgaggcc  | 1020 |
| gccgcggggc  | tgggcctg   | cgtggcgga   | gcgcggggag | ggattgccgc  | gggccgggga  | 1080 |
| ggggcggggg  | cgggcgtgct | gccctctgtg  | gtccttgggc | cgccgccg    | ggtctgtcgt  | 1140 |
| ggtgcctgga  | gcggctgtgc | tcgtcccttg  | cttggccgtg | ttctcgttcc  | tgagggtccc  | 1200 |
| gcggacaccg  | agtggcgag  | tgccaggccc  | agcccgggga | tggcgactgc  | gcctgggccc  | 1260 |
| gcctgggtgtc | ttcgcatccc | tctccgcttt  | ccggcttcag | cgctctaggt  | caggaggctct | 1320 |
| tcgcttttgt  | acagctctaa | ggctaggaat  | ggtttttata | tttttaaaag  | gctttggaaa  | 1380 |
| acaaaaatac  | gcaacagaga | ccgtttgtgt  | gacactttgc | agggaagttt  | gctggcctct  | 1440 |
| gttctaggtc  | atgattgggc | tgcaagggca  | gagaaggtag | ccttgaacag  | aggtcctttt  | 1500 |
| cctcctccta  | agtcgggga  | gccagaggtt  | taactgaccc | ttttggggat  | ttttgagggc  | 1560 |
| agtgatctta  | actttgggtg | cacagttagc  | ttatttgaag | atcttactaa  | aaatacacca  | 1620 |
| gagcccaacc  | tccgaccaat | tacatcaaaa  | cctgtcctag | tgagggtga   | gtattgctgt  | 1680 |
| tttttgaaag  | tttcaaaaag | tgattttgat  | gtgcacctac | gattgagaac  | tgctgtttga  | 1740 |
| ggacagtggg  | tggagtttcg | tattttgaaa  | ttagaagacc | tggagtttcc  | attacaccga  | 1800 |

attggcactt aataactgtt gtcggagcat ttcttaagcc acattttcgt aaagtggctt 1860  
 taaaattgct ctgccagtag gcaggttgct aagatgggtca gagacaaact tctgaacgac 1920  
 tcttgtaaaa tatacagaaa tattttcaga acttttatca gtaaaattac aaaacgtggt 1980  
 gcaaggaagg tgcttgtgat aacactgtcc ccagaacctt agtgaagtta ccaactgggtg 2040  
 gaaaattttc tcttgcactc ggcttaaaaa tcatgaggga atatttacta tacgaatgag 2100  
 attcagtctt taaaggggtt tacagaaacg tgagaggaca ggaacagtta gtctgtgtaa 2160  
 atgtctgaaa tatatgtgag ggagataatg agtttagcct ttttctttaa taggtctcca 2220  
 gattttctgg aaaaggttct ttggcatttg actccatttt gctgtttcat ttgtcagact 2280  
 tctttttgtc cctctttact tctccccaca taattcacca gtactagtgt tttgtttttc 2340  
 agaccaagtc tcgctctgtc gcccgaggctg gagtgcagtg gcgcgatctc agctcactgc 2400  
 aacctccgcc tcccagggtc aagcaattct cctgcctcag cctcccgggt agctgggact 2460  
 acaggcgcg cccgccacgc ctggctaatt ttttatattt tagtagagac ggcgtttcac 2520  
 catgttggcc aggatgggtc cgatctgttg acgtcgtgat ccacccgcct cggcctccca 2580  
 aagtgtggg attacaggcg tgagccaccc cggccggcca ccagtgtat tcttaagacg 2640  
 cctctgagga atcccttctc cctggccatt gagaatccat gcatgaaccc aggttttcca 2700  
 ccttccctga gcagcttgca tagttccttc ttttaagcgc ctgacttcgt tttgtttgggt 2760  
 gccggttgta cctgagaatg agccttgat agtggagcat tccagctttc cagatatgca 2820  
 gagataatac attggctatc agctacttgg cttggcctat tccgtgttta aaatcttggga 2880  
 ctctttgcta gtttttacag atcagaattt ttcacgtatt aatccagttt tcttagcttc 2940  
 tcttgaagaa tttttggaga tctcttcata ctgagccttc attagcccag gacagtactg 3000  
 ctgtagcagt tcatatattt tttcgcttcc caggcctgtg ttattcactt aagttcatag 3060  
 cctggctcct gcagggttgt acccgagcac agctacttag atgtcctgaa tgtattaccg 3120  
 gttaaattgga ggtttcaaag aacctgctgt ttttggccct gtgctcttga taacagagtg 3180  
 tttgagggac aactttcaca tttgagtttt tccaaaatta aagggtttag aagagtcaca 3240  
 gtatctattg tcaaaaagaa aagaatttaa aaaggcagca attgccagga tacttcat 3300  
 gagcaatgat attttccagt ggaaagtcac atcttaaggg ttaatgcccc ttaactgttg 3360  
 gccgtatttg aaaacaaacc aagctaaaaa caagagacac tgacatgttg tatgacgggtg 3420  
 tgggtgtggat gttgtgttta ttttagtctt gagatctagt tgtaacttcc ttgatttctg 3480  
 tatgtagcca cggagcacca ttacctgtca ccattacctg aatggctata ctgcttgctt 3540  
 tcattttgggt agagtggaaa ggttacctag gtttcagtgc ttgaaaagat ttcagaaagc 3600  
 agtagtacgt ctgggttagac tagaatcagt cctctcctgg gggcagtgga atataatatt 3660

|             |             |            |            |            |            |      |
|-------------|-------------|------------|------------|------------|------------|------|
| ttctgactgc  | taattaa     | tacctgtgat | agccggg    | ggtggcttac | gcctgtaatc | 3720 |
| ccagcacttt  | gggaggccga  | gacgggtgga | tcacgaggtc | agcagatgga | gaccatcctg | 3780 |
| gctaacacgg  | tgaacccccg  | tctctactaa | aatgcaaaa  | aaattagccg | ggtgtggtgg | 3840 |
| tgggcgcctg  | tagtcccagc  | tactcaggag | gctgaggcag | gagaatggca | tgaacctggg | 3900 |
| aggcggagct  | tgagtgagc   | cgagatcatg | tcactgcact | ccagcctggg | cgacagagcg | 3960 |
| agactcgtct  | caaaaaaaa   | aagaaaaaaa | cttatgatgg | acacttaaaa | acactcactg | 4020 |
| agtggggagt  | ggagagcagg  | ggtcccagg  | tagcctgttg | gacatttcca | gggcgacttt | 4080 |
| ttcttttttt  | ttttttaag   | tcaagtgagt | atgccatatg | gaaaagggtg | tgcgtggaga | 4140 |
| aaaagcaagg  | ggctccagag  | tgtaggatga | gacatacacc | ttttgggtta | aaaaggctga | 4200 |
| ggcaggagaa  | tggcgtgaac  | ccgggaggcg | gagcttgca  | tgagctgaga | tcatgccact | 4260 |
| gcactccagc  | ctgggcgaca  | gagcgagact | cttgtctcaa | aataaaaaac | gtttacatgt | 4320 |
| acatgtatat  | tcaacatgta  | caaataatac | ctattcaaaa | gtatttacta | cataaatagg | 4380 |
| tacttacatt  | acctatttac  | tgtaatagtc | aaagcctatg | aagtatctaa | cactgatgtg | 4440 |
| taggtactca  | ctttgcttgc  | cactctatta | ggtgcttttt | atgttattta | atcatgaagc | 4500 |
| ctggccacag  | ggtgcttgtg  | cattgagtgt | gggaacaaga | ttaccatctc | ccttttgagg | 4560 |
| acacaggcct  | agagcagtta  | agcagcttgc | tggaggttca | ctggctagaa | agtggtcagc | 4620 |
| ctgggatttg  | gacacagatt  | tttccactcc | caagtctggc | tgctttttac | ttcactgtga | 4680 |
| ggggtaaaagg | taaatcagct  | gttttctttg | ttcagaaact | ctctccaact | ttgcactttt | 4740 |
| cttaaaggaa  | agtaatggac  | cagtgaaggt | gtggggaagc | attaaaggac | tgactgaagg | 4800 |
| cctgcatgga  | ttccatgttc  | atgagtttgg | agataataca | gcagggtggg | gttgtgtgtg | 4860 |
| gctggtgacc  | catacttggt  | cacctagtt  | agataaacag | tagagtagcc | cctaaacggt | 4920 |
| aaaacccctc  | aacttgtttt  | tgtttttgag | aaagggtctt | gctctgtcgc | tcaggctgga | 4980 |
| gtgcagtggc  | gctgtgcgat  | catggctgac | cttagccttg | acctcccagg | ctccattgat | 5040 |
| cctcatgcct  | tggcccgtag  | ctgggactac | aggtacacac | caccacgcct | ggctaatttt | 5100 |
| tgtatttttt  | tctagagggtg | gggtttcatc | atgttgccca | ggctggtctt | gaactgctgg | 5160 |
| gctcaagtgg  | tctatcctcc  | tcgacctccc | aaagtgtctg | gattacatgt | gtgagccact | 5220 |
| gtgcctggga  | aaacctcaa   | cttttctttt | aaaaagagg  | tcaactttat | tgtatataag | 5280 |
| cactgtgcta  | aaattgcagg  | aactgggacc | atatcctgat | ttttgtaata | atgccagcag | 5340 |
| agtacacaca  | agaaaagtaa  | ctgcactaga | ttgtgaagac | tggggtggac | ctgcttctga | 5400 |
| agggtccagt  | ccctttgtct  | taagatttgg | tgtagtgtgt | ctttagaaac | caaaaaaaga | 5460 |

|            |            |            |            |            |             |      |
|------------|------------|------------|------------|------------|-------------|------|
| gaagaagatc | aaccttaaga | ttagccacaa | aactgggctt | tgatacctag | gtgtggaaaa  | 5520 |
| gaaagggaaa | gagttgatgt | tttgtcttac | agcatcattg | tagaagaggg | tgtttttttg  | 5580 |
| tttgtttggt | ttttgagacg | gagtcttact | ctgtggccca | ggctggagtg | cagtggcgcg  | 5640 |
| atctcggtc  | actgcaagct | ccgcctcccg | ggttcatgcc | attctcctgc | ctcagcccc   | 5700 |
| tgagtagctg | ggactacagg | tgcccgccac | ccgcctggc  | taattttttg | tatttttagt  | 5760 |
| agagacgggg | tttactgtg  | ttagccaaga | tgggtctctc | cctgacctcg | tgatccgcct  | 5820 |
| gtctcagcct | cccaaagtgc | tgggattaca | ggcatgagcc | accgcacca  | gccagaagag  | 5880 |
| ggtgtttttt | aaagaaggca | aataggaaat | aaaaacttgg | gctcttaact | tttgtaatga  | 5940 |
| tcccaggtgt | ttgagctggg | ggttgagggg | gggtgcctcg | agcaaagggg | ctgcatttat  | 6000 |
| ttgcataatg | ccatgtaaga | gtagctctac | accccaaaca | caggcttctt | agtgggacca  | 6060 |
| aagtatgata | caaactgaag | atggaatgca | gaggattatt | ggtacttttg | aatatgctta  | 6120 |
| aaaaaaat   | ttttaagta  | tttttaaaaa | atcaggcaac | ccctgaacca | gagtaggttc  | 6180 |
| agagaaactg | caaatttta  | ttttcttaat | ttgggattgg | aagcaagtta | acagaagttt  | 6240 |
| atgagttaag | ttgcatttag | tgatcttttg | ccatatttga | gtaataatct | gatttttttg  | 6300 |
| tttatagatt | tcttcttaaa | ttaactttat | tcactctgct | aatttagttt | caaatagtga  | 6360 |
| tttgtaatga | tcagatttga | tccatttctg | taattgctga | aattccccg  | agttgctttt  | 6420 |
| tggctttacc | gcctctggtc | tgggaggtga | ttgctctgct | gcttctgta  | acttgccctgc | 6480 |
| ctttctccct | gtgtgggact | cctgcgggtg | agagcgtggc | tgaagacagc | cgtgttatga  | 6540 |
| aagggcctcc | tgtgctgtcg | aggttgtgct | ctgtgaatgt | catcccctgg | tgcacagcag  | 6600 |
| caccttctac | acaggatata | gttggaatgc | cgccccctcg | agttgtgtaa | ggcagcagcc  | 6660 |
| ttggcccttg | cacataagat | gctgttgaat | attctgcctg | caccaagtaa | agggcacaga  | 6720 |
| tagaactgct | tggcatatgt | tgctggggag | atgagttttt | tgtaaagtat | actacgttct  | 6780 |
| taagaatttg | gatcataacc | atgggatttt | aataatagaa | aaactgttga | agatcagtct  | 6840 |
| ggtcccttat | ttttacagtg | aagaagccaa | agcccagaga | aggggtgtta | ctttacaagt  | 6900 |
| gtcagacagt | agttagaact | tgggtggggt | tttttttttt | tttttttgag | atggagtcct  | 6960 |
| gctctgttgc | ccaggctgga | gtgcagtggg | gcatctcag  | ctcactgcaa | cctctgcctc  | 7020 |
| ccaggttcaa | gcatctctcc | tgccctcagc | tactaagtag | ctgggactat | aggtgcgcac  | 7080 |
| caccacgcct | agctaatttt | tgtatttttt | cagtagagac | agggttttgc | tatgctggcc  | 7140 |
| aggtggtct  | caaactcctg | acctcagatg | atccagccac | ctcagcttcc | caaagtgtcg  | 7200 |
| gggttccagg | tgttagccac | catgcctggc | catagacttg | tttctgttcc | cttctcactg  | 7260 |
| tggctgtacc | aagggtgtgc | ttatcccaga | agtcgtgatg | caggtcagca | ctttctccat  | 7320 |

|            |            |             |             |            |             |      |
|------------|------------|-------------|-------------|------------|-------------|------|
| gggaagtttt | agcagtgttt | cttttttagaa | tgtatttggg  | aactttaatt | cataatttag  | 7380 |
| cttttttttc | ttcttcttat | aaataggctg  | taccagtgc   | ggtcctcact | ttaatcctct  | 7440 |
| atccagaaaa | cacggtgggc | caaaggatga  | agagaggtaa  | caagatgctt | aactcttgta  | 7500 |
| ataatggcga | tagctttctg | gagttcatat  | ggatatactac | ttgtaaata  | gtgctaagat  | 7560 |
| aattccgtgt | ttccccacc  | tttgcttttg  | aacttgctga  | ctcatctaaa | cccctgctcc  | 7620 |
| caaagtctgg | aatgctttta | cttcctgggc  | ttaaaggaat  | tgacaaatgg | ggacacttaa  | 7680 |
| aacgatttgg | ttttgtagca | tttattgaat  | atagaactaa  | tacaagtgcc | aaaggggaac  | 7740 |
| taatacagga | aatgtcatga | acagtactgt  | caaccactag  | caaaatcaat | catcattgtg  | 7800 |
| aaacatagga | agcttctgta | gataaaaaaa  | aaaattgata  | ctgaaaacta | gtcgagactc  | 7860 |
| catttatatg | tgtatgtttt | ctgaaagcct  | ttcagaaaaa  | tattaaattt | aaggacaaga  | 7920 |
| tttttatatc | agaggccttg | ggacatagct  | ttgttagcta  | tgccagtaat | taacaggcat  | 7980 |
| aactcagtaa | ctgagagtgt | accctttggg  | acttctgaaa  | tcaggtgcag | ccccatcttt  | 8040 |
| cttcccagag | cattagtgtg | tagacgtgaa  | gccttgtttg  | aagagctgta | tttagaatgc  | 8100 |
| ctagctactt | gtttgcaaat | ttgtgtctac  | tcagtcaagt  | tttaatttag | ctcatgaact  | 8160 |
| accttgatgt | ttagtggcat | cagcccta    | ccatctgatg  | ctttttcatt | attaggcatg  | 8220 |
| ttggagactt | gggcaatgtg | actgctgaca  | aagatgggtg  | ggccgatgtg | tctattgaag  | 8280 |
| attctgtgat | ctcactctca | ggagaccatt  | gcattcattg  | cgcacactg  | gtggtaagtt  | 8340 |
| ttcataaaa  | gatatgcata | aaacttcttc  | taacatacag  | tcattgtatc | tttcactttg  | 8400 |
| attgttagtc | gcggtttcta | aagatccaga  | taaactgtac  | ttgcagttca | aattaggaaa  | 8460 |
| agcaatttta | ttggacaatt | acggtgaaaa  | tgaattattt  | tatctaggtc | agttaagaac  | 8520 |
| actgttctgc | taagatgcag | taaaaagcag  | gttacatttg  | accatattag | atctgagttt  | 8580 |
| ggaaaacaga | agtagtcttt | agttttaaaa  | tggccagatt  | ttcttgccag | gattgggttt  | 8640 |
| ctcacttggt | aaacagaaca | ttttgttaag  | tttaaaacct  | gggatggact | taagtattca  | 8700 |
| tgttcattca | tgttcattca | ggactgcagg  | ttatcatgac  | ttgtttaact | tgtagggaagc | 8760 |
| tgtagtccca | agttatcctg | gggaactgca  | tctggttctt  | gcaaaacacc | aagtagacag  | 8820 |
| gctctctttt | acctcccctt | gagggcatta  | acattcagta  | gtcacttcca | ttcagttaac  | 8880 |
| cctttatttt | tatgggtttt | cttgagccat  | agttgtaaag  | cagaaaaatc | atttataaag  | 8940 |
| gtttgttgaa | caaaattcaa | aatactgttg  | cttaaagtat  | taagattttt | taggattata  | 9000 |
| ccttacttat | aggcccgta  | ttcatttggc  | atgaaatttt  | gagttttatt | cactttcact  | 9060 |
| ttcctttttt | tccaaagcaa | ttaaaaaac   | tgccaaagta  | agagtgactg | cggaaactaag | 9120 |



gttactgtaa cttaccatgg aggattaagg gtagcgtgtg gtggtctaca acatagttat 9180  
 ttgggtttta gtatttcatt tagacagcaa cacttaccta atgtttaaag gtaatgtctt 9240  
 tgcaacacca agaaaaagct ttgagtagta gtttctactt ttaaactact aaatattagt 9300  
 atatctctct actaggatta atgttatatt tctaataatta tgaggttctt aaacatcttt 9360  
 tgggtattgt tgggaggagg tagtgattac ttgacagccc aaagttatct tcttaaaatt 9420  
 ttttacaggt ccatgaaaaa gcagatgact tgggcaaagg tggaaatgaa gaaagtacaa 9480  
 agacaggaaa cgctggaagt cgtttggtt gtggtgtaat tgggatcgcc caataaacat 9540  
 tcccttggat gtagtctgag gcccttaac tcatctgtta tctgctagc tgtagaaatg 9600  
 tatcctgata aacattaaac actgtaatct taaaagtgtg attgtgtgac tttttcagag 9660  
 ttgcttttaa gtacctgtag tgagaaactg atttatgatc acttgaaga tttgtatagt 9720  
 ttataaaaac tcagttaaaa tgtctgtttc aatgacctgt attttgccag acttaaatca 9780  
 cagatgggta ttaaacttgt cagaatttct ttgtcattca agcctgtgaa taaaaacct 9840  
 gtatggcact tattatgagg ctattaaaag aatccaaatt caaactaaat tagctctgat 9900  
 acttatttat ataaacagct tcagtggaac agatttagta atactaacag tgatagcatt 9960  
 ttattttgaa agtgttttga gaccatcaaa atgcatactt taaaacagca ggtcttttag 10020  
 ctaaaactaa cacaactctg cttagacaaa taggctgtcc ttgaaagct ttagggaaat 10080  
 gttcctgctt agtcatttta gcattttgat tcataaagta ctcctcatt ttaaaaagac 10140  
 attatgatgt aagagagcca tttgataact ttttagtgag ctttgaaagg caagttacag 10200  
 cctcagctag ctagtaagat tatctacctg ccagaatggc acaaattcta cattcaaggg 10260  
 tagacgctgg cacaacctac ttacagatta gccctttaaa gcaatctgta gcattagaag 10320  
 atggaaccaa ggaaatgttt gactgtgggt tctggctgtt gagaaataat ttacacaccg 10380  
 aattagttaa atgagtcact ttctcttaat gtatttatgt acctgagaga atgcttttca 10440  
 atgttaacct aactcaggtt tgactaaatt attcaattgg aaattgtaga atattatttc 10500  
 tgataaacca gaaataagtg aaatgctgtt tgttcataaa tatgtacttt atcaaagtga 10560  
 ggagagatca tttaggagag gaaaagctaa attggaagac aaatctgtag tgtttccaaa 10620  
 gttttaaaat tatggtaaac aacagtatgt tcacagtaag tggttaaaac aaccattctt 10680  
 taaatctcag tagagaatth ttaaaaagca gtatttaaca catttccta atgtagtttg 10740  
 ttgcctatgt ggaataactc aattagagac tcacttatgc cttttgaaac ttcaaata 10800  
 attacactac cagtttttac atgtgcatat aggatgggtc caatacttta aattggaaat 10860  
 acaggctgta agtccttcaa gtctggatgt tgggtaatca cgttttcttc cagaagccat 10920  
 ttgttaggac tttaaaactt ctcagtgggc cagtgtaaaa ttaaggacaa gttttataat 10980

ttaaatttac agataaatat

11000

<210> 11  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

<400> 11  
 cgacggccca gtgcaggcca tcatcaattt cgagcagaag gctgtaccag tgcaggctct 60  
 cactttaatc ctctatccag aaaacacggg gggccaaagg atgaagagag gcatgttgga 120  
 gacttgggca atgtgactgc tgacaaagat ggtgtggccg atgtgtctat tgaagattct 180  
 gtgatctcac tctcaggaga ccattgcac attggccgca cactgggtgg ccatgaaaaa 240  
 gcagatgact tgggcaaagg tggaaatgaa gaaagtacaa agacaggaaa cgctggaagt 300  
 cgtttggctt gtggtgtaat tgggatcgcc caataaacat tcccttgga gtagtctgag 360  
 gcccttaac tcatctgtta tctgtctagc tgtagaaatg tatcctgata aacattaaac 420  
 actgtaatct taaaaaaa 438

<210> 12  
 <211> 499  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> 462  
 <223> unknown

<400> 12  
 tttggggcca gagtgggcca ggcgcggagg tctggcctat aaagtagtcg cggagacggg 60  
 gtgctgggtt gcgtcgtagt ctctgcagc gtctgggggt tccgttgca tctcggaaac 120  
 caggacctcg gcgtggccta gcgagttatg gcgacgaagg ccgtgtgcgt gctgaagggc 180  
 gacggccagt tgcagggcac catcaatttc gagcagaagg aaagtaatgg accagtgaag 240  
 gtgtggggaa gcattaaagg actgactgaa ggcctgcatg gattccatgt tcatgagttt 300  
 ggagataata cagcaggctg taccagtga ggtcctcact ttaatcctct atccagaaaa 360  
 cacggtgggc caaaggatga agagaggcat gttggagact tgggcaatgt gactgctgac 420  
 aaagatgggtg tggccgatgt gtctattgaa gattctgtga tntccactc tccaggagac 480  
 cattgcatca ttggccgtn 499

<210> 13  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 13  
 tcagcacgca cacggccttc 20

<210> 14  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 14  
 gcccttcagc acgcacacgg 20

<210> 15  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 15  
 gtcgcccttc agcacgcaca 20

<210> 16  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 16  
 cgaggactgc aacggaaacc 20

<210> 17  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223>Antisense Oligonucleotide

<400> 17  
 ggttccgagg actgcaacgg 20

<210> 18  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 18  
tcctggttcc gaggactgca 20

<210> 19  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 19  
gaggtcctgg ttccgaggac 20

<210> 20  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 20  
taggccacgc cgaggtcctg 20

<210> 21  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 21  
gtcgccataa ctcgctaggc 20

<210> 22  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 22  
gccctgcact gggccgtcgc 20

<210> 23  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 23

aattgatgat gccctgcact

20

<210> 24

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 24

cactgggtcca ttactttcct

20

<210> 25

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 25

acaccttcac tgggtccatta

20

<210> 26

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 26

ccacaccttc actggtccat

20

<210> 27

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 27

agtccttttaa tgcttcccca

20

<210> 28

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 28  
 aggccttcag tcagtccttt 20

<210> 29  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 29  
 caggccttca gtcagtcctt 20

<210> 30  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 30  
 tatctccaaa ctcatgaaca 20

<210> 31  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 31  
 gctgtattat ctccaaactc 20

<210> 32  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 32  
 gtacagcctg ctgtattatc 20

<210> 33  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 33  
 tgcccaagtc tccaacatgc 20

<210> 34  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 34  
 cacattgccc aagtctccaa 20

<210> 35  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 35  
 tcggccacac catctttgtc 20

<210> 36  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 36  
 catcgccac accatctttg 20

<210> 37  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 37  
 acacatcggc cacaccatct 20

<210> 38  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 38

|                                 |    |
|---------------------------------|----|
| tagacacatc ggccacacca           | 20 |
| <br>                            |    |
| <210> 39                        |    |
| <211> 20                        |    |
| <212> DNA                       |    |
| <213> Artificial Sequence       |    |
| <220>                           |    |
| <223> Antisense Oligonucleotide |    |
| <400> 39                        |    |
| accaccagtg tgcggccaat           | 20 |
| <br>                            |    |
| <210> 40                        |    |
| <211> 20                        |    |
| <212> DNA                       |    |
| <213> Artificial Sequence       |    |
| <220>                           |    |
| <223> Antisense Oligonucleotide |    |
| <400> 40                        |    |
| catggaccac cagtgtgcgg           | 20 |
| <br>                            |    |
| <210> 41                        |    |
| <211> 20                        |    |
| <212> DNA                       |    |
| <213> Artificial Sequence       |    |
| <220>                           |    |
| <223> Antisense Oligonucleotide |    |
| <400> 41                        |    |
| tcatggacca ccagtgtgcg           | 20 |
| <br>                            |    |
| <210> 42                        |    |
| <211> 20                        |    |
| <212> DNA                       |    |
| <213> Artificial Sequence       |    |
| <220>                           |    |
| <223> Antisense Oligonucleotide |    |
| <400> 42                        |    |
| ggcgatccca attacaccac           | 20 |
| <br>                            |    |
| <210> 43                        |    |
| <211> 20                        |    |
| <212> DNA                       |    |
| <213> Artificial Sequence       |    |
| <220>                           |    |
| <223> Antisense Oligonucleotide |    |
| <400> 43                        |    |
| ggaatgttta ttgggcgatc           | 20 |



<210> 44  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 44  
 cctcagacta catccaaggg 20

<210> 45  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 45  
 gataacagat gagttaaggg 20

<210> 46  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 46  
 cacaattaca cttttaagat 20

<210> 47  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 47  
 agtcacacaa ttacactttt 20

<210> 48  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 48  
 ctactacag gtactttaaa 20

<210> 49  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 49  
 aatcagtttc tcactacagg 20

<210> 50  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 50  
 ataaatcagt ttctcactac 20

<210> 51  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 51  
 cataaatcag tttctcacta 20

<210> 52  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 52  
 aatcttccaa gtgatcataa 20

<210> 53  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 53  
 atacaaatct tccaagtgat 20

<210> 54  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 54  
 tgagttttat aaaactatac

20

<210> 55  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 55  
 aactgagttt tataaaacta

20

<210> 56  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 56  
 acagacattt taactgagtt

20

<210> 57  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 57  
 attgaaacag acattttaac

20

<210> 58  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Antisense Oligonucleotide

<400> 58  
 tcattgaaac agacatttta

20

<210> 59

<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 59  
atacaggtca ttgaaacaga

20

<210> 60  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 60  
ccatctgtga tttaagtctg

20

<210> 61  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 61  
tttaataccc atctgtgatt

20

<210> 62  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 62  
agtttaatac ccatctgtga

20

<210> 63  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 63  
caaagaaatt ctgacaagtt

20

<210> 64  
<211> 20

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 64  
ttgaatgaca aagaaattct

20

<210> 65  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 65  
acaggcttga atgacaaaga

20

<210> 66  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 66  
attcacaggc ttgaatgaca

20

<210> 67  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 67  
ggtttttatt cacaggcttg

20

<210> 68  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 68  
agggttttta ttcacaggct

20

<210> 69  
<211> 20  
<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 69

atacaggggtt tttattcaca

20

<210> 70

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 70

ccatacaggg tttttattca

20

<210> 71

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 71

aagtgccata cagggttttt

20

<210> 72

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 72

taataagtgc catacagggt

20

<210> 73

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 73

tcataataag tgccatacag

20

<210> 74

<211> 20

<212> DNA

<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 74  
ctcataataa gtgccataca 20

<210> 75  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 75  
gcctcataat aagtgccata 20

<210> 76  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 76  
ttttaatagc ctcataataa 20

<210> 77  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 77  
ggattctttt aatagcctca 20

<210> 78  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 78  
cagcccttgc cttctgctcg 20

<210> 79  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 79  
agtagctggg actacaggcg 20

<210> 80  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 80  
cattactttc ctttaagaaa 20

<210> 81  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 81  
aagatcacta aatgcaactt 20

<210> 82  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 82  
caggagaatc gcttgaacct 20

<210> 83  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 83  
ctggtagcgc ctatttataa 20

<210> 84  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>



<223> Antisense Oligonucleotide

<400> 84

gcttcacgtc tacacactaa

20

<210> 85

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 85

tccaacatgc ctaataatga

20

<210> 86

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 86

tggtacagcc ttctgctcga

20

<210> 87

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 87

taggccagac ctccgcgcct

20

<210> 88

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 88

actttatagg ccagacctcc

20

<210> 89

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 89  
gacgcaaacc agcaccctgt

20

<210> 90  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Antisense Oligonucleotide

<400> 90  
acgctgcagg agactacgac

20